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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/352,362	07/13/1999	SHUNPEI YAMAZAKI	0756-1996	2149

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EXAMINER	
DIAZ, JOSE R	

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 12/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/352,362	YAMAZAKI ET AL.	
	Examiner	Art Unit	
	José R Díaz	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 October 2003*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-24,28,30-115 and 123-176* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-24,28,30-115 and 123-176* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *16,33* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 20, 22-23, 102-115, and 174-175 are still rejected under 35 U.S.C. 102(b) as being anticipated by Yamazaki et al. (JP 10-1035,469).

Regarding claim 20, Yamazaki et al. teach a method comprising the steps of: adding an element (106) for facilitating crystallization of an amorphous semiconductor thin film (103) (see Fig. 1B); carrying out a first heat treatment (1st heat treatment) to transform the amorphous semiconductor thin film into a crystalline semiconductor thin film (see Fig. 1C and paragraph [0041])); carrying out a second heat treatment of irradiating a laser light to said crystalline semiconductor thin film (see paragraph [0045]); carrying out a third heat treatment at 900-1200 °C in a reducing atmosphere after the second heat treatment (see paragraph [0064]).

Regarding claims 22-23, Yamazaki et al. teach a method comprising the steps of: adding an element (106) for facilitating crystallization of an amorphous semiconductor

thin film (103) (see Fig. 1B); carrying out a first heat treatment (1st heat treatment) to transform the amorphous semiconductor thin film into a crystalline semiconductor thin film (see Fig. 1C and paragraph [0041]); carrying out a second heat treatment of irradiating a laser light to said crystalline semiconductor thin film (see paragraph [0045]); carrying out a third heat treatment at 900-1200 °C in a reducing atmosphere including a halogen element after the second heat treatment (see paragraph [0064]).

Regarding claims 102-115, Yamazaki et al. teach that the semiconductor device is a video camera, a digital camera, a projector, a head mount display, a car navigation system, a personal computer, a portable information terminal (see figure 16).

Regarding claims 174-175, Yamazaki et al. teaches patterning the crystalline semiconductor after the second heat treatment and forming a gate insulating film (see paragraph [0046]-[0047]).

3. Claims 20, 22-23, 102-115, and 174-175 are still rejected under 35 U.S.C. 102(e) as being anticipated by Yamazaki et al. (US 2002/0100937 A1).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claims 20, Yamazaki et al. teach a method comprising the steps of: adding an element (106) for facilitating crystallization of an amorphous semiconductor thin film (103) (see Fig. 1B); carrying out a first heat treatment (1st heat treatment) to transform the amorphous semiconductor thin film into a crystalline semiconductor thin film (see Fig. 1C and paragraph [0059])); carrying out a second heat treatment of irradiating a laser light to said crystalline semiconductor thin film (see paragraph [0063]); carrying out a third heat treatment at 900-1200 °C in a reducing atmosphere after the second heat treatment (see paragraph [0084]).

Regarding claims 22-23, Yamazaki et al. teach a method comprising the steps of: adding an element (106) for facilitating crystallization of an amorphous semiconductor thin film (103) (see Fig. 1B); carrying out a first heat treatment (1st heat treatment) to transform the amorphous semiconductor thin film into a crystalline semiconductor thin film (see Fig. 1C and paragraph [0059]); carrying out a second heat treatment of irradiating a laser light to said crystalline semiconductor thin film (see paragraph [0063]); carrying out a third heat treatment at 900-1200 °C in a reducing atmosphere including a halogen element after the second heat treatment (see paragraphs [0067] and [0084]).

Regarding claims 102-115, Yamazaki et al. teach that the semiconductor device is a video camera, a digital camera, a projector, a head mount display, a car navigation system, a personal computer, a portable information terminal (see figure 16).

Regarding claims 174-175, Yamazaki et al. teaches patterning the crystalline semiconductor after the second heat treatment and forming a gate insulating film (see paragraph [0064]-[0065]).

Doubl Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 15-24, 28, 30-115 and 123-176 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-18 of copending Application No. 09/894,125, and over claims 1-32 of copending Application No. 09/369,158. Although the conflicting claims are not identical, they are not patentably distinct from each other because the method discloses by the copending Application essentially discloses all claimed feature. For example, the copending applications recite the limitations, as required by the present application, of: crystallizing an amorphous layer, irradiating the semiconductor film, etching the film after the step of irradiating; and performing a further heat treatment in a reducing atmosphere.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. Claim 15-16, 20-21, 28, 30-115 and 123-176 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-77 of copending Application No. 10/081,767 in view of Yamazaki et al. (US Pat. No. 5,907,770).

Claims 15-16, 20-21, 28, 30-31, 34-35, 42-48, 53-55, 60-62, 67-69, 74-76, and 81-83 of the present Application recites the steps of: adding an element for facilitating crystallization of an amorphous layer (which is recited in claims 6-8 of the copending Application); performing a first heat treatment (which is recited in claims 6-8 of the copending Application); irradiating a laser light (which is recited in claims 6-8, 9, 27, 38, 49, 54 and 66 of the copending Application); and carrying out a second heat treatment at 900 °C to 1200 °C in a reducing atmosphere (which is recited in claims 6-8 of the copending Application). Please note that although claims 6-8 of the copending Application does not recite the claimed temperature range, it is obvious from claims 4-5 of the copending Application that such second heat treatment is performed at such high temperatures. Therefore, it would have been obvious to one having ordinary skill in the art at the same time the invention was made to modify the invention recited in claims 6-8 of the copending Application to include a temperature range of 900 °C to 1200 °C. The ordinary artisan would have been motivated to modify the copending Application in the manner described above for at least the purpose of flattening the substrate and reducing the warp of the substrate.

With regards to the reducing atmosphere, claims 6-8 of the copending Application do not recite such a limitation. However, Yamazaki et al. (US Pat. No.

5,907,770) discloses that nitrogen and hydrogen are well-known reducing atmospheres used in the art (see col. 13, lines 63-65; col. 14, lines 4-6; col. 17, lines 51-54; and col. 24, lines 54-56). Therefore, it would have been obvious to one having ordinary skill in the art at the same time the invention was made to modify the copending Application to include nitrogen and hydrogen reducing atmospheres. The ordinary artisan would have been motivated to modify the copending Application in the manner described above for at least the purpose of flattening the substrate and reducing the warp of the substrate.

Claims 32 and 33 of the present Application recite the further step of etching the crystallized semiconductor film after the step of irradiating the film. This additional limitation can be found in claim 8 of the copending Application.

Claims 36-41 of the present Application recite the further limitation that said heating step is carried out by furnace annealing. This additional limitation can be found in claims 11, 17, 29, 40, 56, and 68 of the copending Application.

Claims 49-52, 56-59, 63-66, 70-73, 77-80, 84-87 of the present Application recite the further limitation that the crystallizing step is carried out by irradiating an infrared light and/or ultraviolet light. This additional limitation can be found in claims 9-12, 15, 17-18, 21, 27-30, 32-33, 38-41, 44, 49-50, 54-57, 60, and 66-69 of the copending Application.

Claims 88-115 and 123-176 of the present Application recite the further limitation that the semiconductor device is a video camera, a digital camera, a projector, a head mount display, a car navigation system, a personal computer, and a portable

information terminal. This additional limitation can be found in claims 26, 37, 48, 53, 65, and 77 of the copending Application.

This is a provisional obviousness-type double patenting rejection.

Response to Arguments

7. Applicant's arguments filed October 1, 2003 have been fully considered but they are not persuasive.

With regards to the "flattening" limitation, Yamazaki et al. (JP 10-1035,469) teaches such limitation in paragraphs [0058], [0064] and [0112] and Yamazaki et al. (US 2002/0100937 A1) teaches the same in paragraphs [0075], [0084] and [0137]. Both references teaches as a result of the heating treatment a "an extremely superior interface" is created (see, for example, paragraph [0084] of Yamazaki et al. (US 2002/0100937 A1)). Thus, the Yamazaki et al. references disclosed the claimed limitations.

With regards to the argument that the heat treatment in a reducing atmosphere is not carried immediately after the irradiation step, please note that nowhere in the rejected claims applicant recite such language. As such, the limitations are still rejected in view of the Yamazaki et al references.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ohtani et al. (US Pat. No. 6,559,036 B1) discloses the steps of crystallizing, laser annealing and thermal annealing (see figs. 1A-1E).

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Correspondence

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R Díaz whose telephone number is (703) 308-6078 or (571) 272-1727, after February 9, 2004. The examiner can normally be reached on 9:00-5:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JRD

GEORGE ECKERT
PRIMARY EXAMINER